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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/464,372 12/15/99 PAULRAJ

A GWI-102

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WM02/0214

EXAMINER

JIANG, L

ART UNIT

PAPER NUMBER

2634

DATE MAILED:

02/14/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
09/464,372

Applicant(s)

Paulraj et al.

Examiner

Lenny Jiang

Group Art Unit

2734



☒ Responsive to communication(s) filed on Dec 15, 1999

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1035 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claim

☒ Claim(s) 1-34 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-3, 5, 7, 8, 11-16, 18-21, 23-25, 27, 30, and 32-34 is/are rejected.

☒ Claim(s) 4, 6, 9, 10, 17, 22, 26, 28, 29, and 31 is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☒ The drawing(s) filed on Dec 15, 1999 is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s) 3

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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## **DETAILED ACTION**

### ***Specification***

1. The disclosure is objected to because of the following informalities: on Page 8, Line 3, "and" should be changed to --an--. Page 11, Line 1, --of-- should be inserted after "more". Page 17, Line 19, "difference" should be changed to --different--. Page 17, Line 29, "is be" should be changed to --is to be--. Page 24, Line 5, "5" should be changed to --5A--. Appropriate correction is required.

### ***Claim Objections***

2. Claims 3, 4 and 14 are objected to because of the following informalities: in Claim 3, Line 2, "transmitter" should be changed to --transmit unit--. Claim 4, Line 2, "transmitter" should be changed to --transmit unit--. Claim 14, Line 2, "transmitter" should be changed to --transmit unit--. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who

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has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

4. Claims 1-3, 5, 7, 8, 11-16, 18-21, 23-25, 27, 30 and 32-34 are rejected under 35

U.S.C. 102(e) as being anticipated by Paulraj et al. (U.S. Patent Number 6,067,290).

Regarding Claims 1, 7, 8, 11-16, 18-21, 23-25, 27, 30 and 32-34, Paulraj et al. disclose a spatial multiplexing system in a cellular network used in conjunction with one or more multiple access protocols. A wireless cellular network is used for transmitting subscriber datastreams to corresponding subscriber units. The network includes base stations and a logic. The base stations each include spatially separate transmitters for transmitting, in response to control signals, selected substreams of each subscriber datastream. A transmitter may be equipped with M antennas while a receiver may be equipped with N antennas. The logic assigns the number of substreams to be transmitted. The receivers in the base station are spatially separate receivers which "receiv[e] composite signals resulting from the spatially separate transmission of spatially separate source signals corresponding to selected substreams of an uplink subscriber datastream from selected ones of the subscriber units..." A spatial processor is responsive to the control signal and is used to separate the composite signals into estimated source signals based on the received data. A configurable logic responsive to the control signal is able to vary both the number of composite signals separated as well as the number of estimated source signals. See Figure 3 and Column 5 Line 37 to Column 6 Line 30, and Column 12 Line 39 to Column 14 Line 63.

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Regarding Claims 2 and 3, depending on the number of antennas used in the transmitter and the receiver, the stream of coded information is split into that number of separate substreams. The spatial multiplexed streams must be processed by the circuitry to produce coded streams before transmission.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

6. Claims 1, 2, 7, 21 and 25 are rejected under 35 U.S.C. 102(a) as being anticipated by The Board of Trustees of the Leland Stanford Junior University (WO 98/09381).

The Board of Trustees PCT publication discloses a system of digital wireless communication between a base station and a subscriber unit with a spatial channel comprising an adaptive array of  $M_t$  antenna elements at the base station and an adaptive array of  $M_r$  antenna elements at the subscriber unit. The number  $L$  of independent spatio-temporal subchannels in the transmission system is determined from channel information and characteristics.

***Allowable Subject Matter***

7. Claims 4, 6, 9, 10, 17, 22, 26 28, 29 and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the

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limitations of the base claim and any intervening claims, also overcoming all claim objections of Paragraph 2 above.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Prior art references Barratt et al. (U.S. Patent Number 5,592,490), Roy, III et al. (U.S. Patent Number 5,642,353), Ottersten et al. (U.S. Patent Number 5,828,658) and Scherzer (U.S. Patent Number 6,108,565) are made of reference as describing related communication systems.

9. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**or faxed to:**

(703) 308-9051 or (703) 308-9052, (for formal communications intended for entry)

**Or:**

(703) 305-3988, (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lenny Jiang, whose telephone number is (703) 308-6740. The Examiner can normally be reached on Monday-Friday from 8:00 AM - 4:30 PM.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-4700.

February 9, 2001



Lenny Jiang



**STEPHEN CHIN**  
**SUPERVISORY PATENT EXAMINER**  
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